

**N - CHANNEL ENHANCEMENT MODE
POWER MOS TRANSISTOR**

S G S-THOMSON

30E D

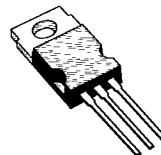
TYPE	V _{DSS}	R _{DS(on)}	I _D
BUZ10A	50 V	0.12 Ω	17 A

- HIGH SPEED SWITCHING
- LOW R_{DS (ON)}
- EASY DRIVE FOR COST EFFECTIVE APPLICATIONS.

INDUSTRIAL APPLICATIONS:

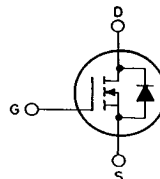
- AUTOMOTIVE POWER ACTUATOR DRIVES
- MOTOR CONTROLS
- DC-DC CONVERTERS

N - channel enhancement mode POWER MOS field effect transistor. Easy drive and very fast switching times make this POWER MOS transistor ideal for high speed switching circuits in applications such as power actuator driving, motor drives including brushless motors, hydraulic actuators and many other uses in automotive and automatic guided vehicle applications. It is also used in DC/DC converters and uninterruptible power supplies.



TO-220

**INTERNAL SCHEMATIC
DIAGRAM**



ABSOLUTE MAXIMUM RATINGS

V _{DS}	Drain-source voltage (V _{GS} = 0)	50	V
V _{DGR}	Drain-gate voltage (R _{GS} = 20 K Ω)	50	V
V _{GS}	Gate-source voltage	± 20	V
I _D	Drain current (continuous) T _c = 30°C	17	A
I _{DM}	Drain current (pulsed)	65	A
P _{tot}	Total dissipation at T _c < 25°C	75	W
T _{stg}	Storage temperature	-55 to 150	°C
T _j	Max. operating junction temperature	150	°C
	DIN humidity category (DIN 40040)	E	
	IEC climatic category (DIN IEC 68-1)	55/150/56	

THERMAL DATA

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$R_{thj - case}$	Thermal resistance junction-case	max	1.67	°C/W
$R_{thj - amb}$	Thermal resistance junction-ambient	max	75	°C/W

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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OFF

$V_{(BR) DSS}$	Drain-source breakdown voltage	$I_D = 1 \text{ mA}$	$V_{GS} = 0$	50			V
I_{DSS}	Zero gate voltage drain current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$	$V_{DS} = \text{Max Rating}$			250 1000	μA μA
I_{GSS}	Gate-body leakage current ($V_{DS} = 0$)	$V_{GS} = \pm 20 \text{ V}$				± 100	nA

ON

$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$	$I_D = 1 \text{ mA}$	2.1		4	V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10 \text{ V}$	$I_D = 10 \text{ A}$			0.12	Ω

DYNAMIC

g_{fs}	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 10 \text{ A}$	3.0			mho
C_{iss}	Input capacitance	$V_{DS} = 25 \text{ V}$	$f = 1 \text{ MHz}$			2000	pF
C_{oss}	Output capacitance	$V_{GS} = 0$				800	pF
C_{rss}	Reverse transfer capacitance					300	pF

SWITCHING

$t_d(on)$	Turn-on time	$V_{DD} = 30 \text{ V}$	$I_D = 3.0 \text{ A}$			45	ns
t_r	Rise time	$R_{GS} = 50 \Omega$	$V_{GS} = 10 \text{ V}$			90	ns
$t_d(off)$	Turn-off delay time					170	ns
t_f	Fall time					140	ns

ELECTRICAL CHARACTERISTICS (Continued)

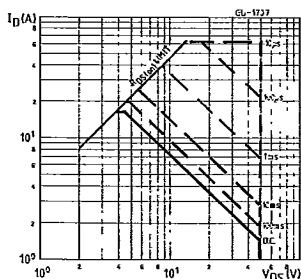
T-39-11

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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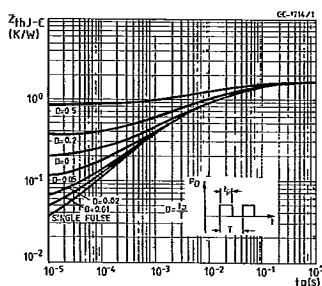
SOURCE DRAIN DIODE

I_{SD} I_{SDM}	Source-drain current Source-drain current (pulsed)	$T_c = 25^\circ C$			17 65	A A
V_{SD}	Forward on voltage	$I_{SD} = 34\text{ A}$ $V_{GS} = 0$			1.5	V
t_{rr} Q_{rr}	Reverse recovery time Reverse recovered charge	$I_{SD} = 17\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$		150 1.0		ns μC

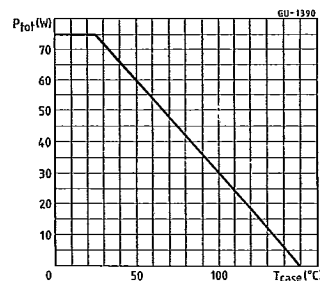
Safe operating areas



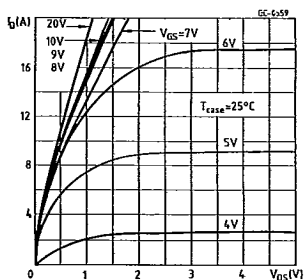
Thermal impedance



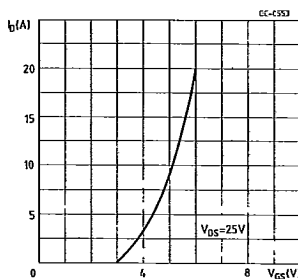
Derating curve



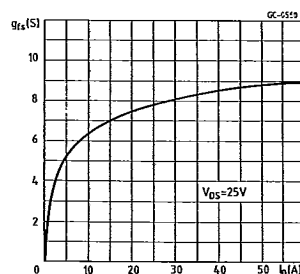
Output characteristics



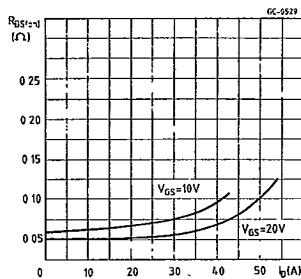
Transfer characteristics



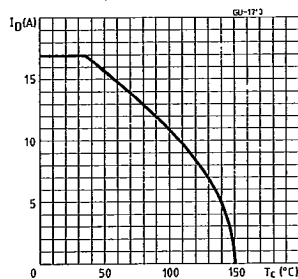
Transconductance



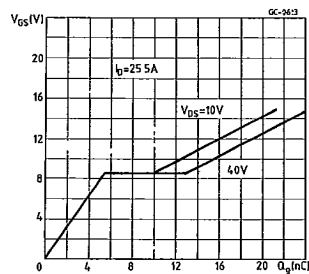
Static drain-source on resistance



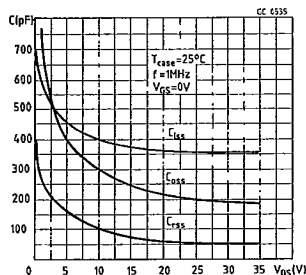
Maximum drain current vs temperature



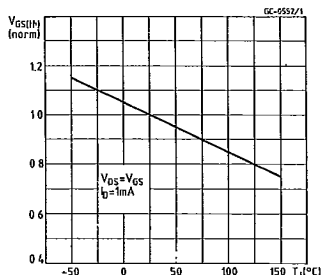
Gate charge vs gate-source voltage



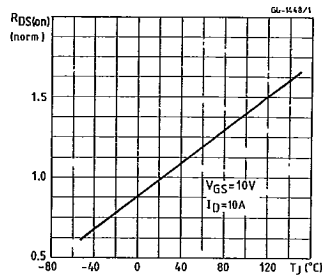
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics

